

Metallomics – a challenge for modern analytical chemistry

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Tentative contents:

- the concept of metallomics
- areas of interest
- experimental approaches including:
 - analysis for metallo- and metal-binding proteins
 - metallometabolomics
 - quantitative metallomics
 - perspectives and future trends

The emerging field of metallomics refers to the entirety of research activities aimed at the understanding of the molecular mechanisms of metal-dependent life processes [1,2]. Metallomics is the study of a metallome, interactions and functional connections of metal ions and their species with genes, proteins, metabolites and other biomolecules within organisms and ecosystems. The comprehensive analysis for elemental species in biological samples is a considerable challenge [3]. The proposed series of lectures will discuss advances in analytical techniques and methods for the probing of interactions between metal ions and the organism's genome and the derived -omes: proteome and metabolome. Particular attention is paid to the in-vivo screening for the native metalprotein and metal-metabolite complexes by hyphenated techniques which combine a highresolution separation technique (gel electrophoresis, chromatography or capillary electrophoresis) with sensitive elemental (inductively coupled plasma, ICP) or molecular (electrospray or MALDI) mass spectrometric detection. The contribution of bio-informatics to the prediction of metal-binding sequences in proteins and the role of molecular biology approaches for the detection of metaldependent genes, proteins and metabolites will be highlighted.

1 H. Haraguchi, *J. Anal. At. Spectrom.*, 2004, 19, 5.

2 N. Jakubowski, R. Lobinski, L. Moens, *J. Anal. At. Spectrom.*, 2004, 19, 1.

3 J. Szpunar, *Anal. Bioanal. Chem.*, 2004, 378, 54.

Lecture co-financed by the European Union in scope of the European Social Fund